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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,055	04/08/2004	Kenji Orita	60188-831	7336

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Jack Q. Lever, Jr.
McDERMOTT, WILL & EMERY
600 Thirteenth Street, N.W.
Washington, DC 20005-3096

EXAMINER

NGUYEN, CUONG QUANG

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 01/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/820,055

Applicant(s)

ORITA, KENJI

Examiner

Cuong Q. Nguyen

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 14-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4-8-04, 7-8-04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse Embodiment I, claims 1-13 acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-6, and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Niki et al. (US 2003/0057444).

Regarding claim 1, Niki et al. discloses semiconductor light-emitting device comprising an element having: a semiconductor multilayer film containing a nitride and having an active layer; and a transparent layer (34) provided on the semiconductor multilayer film and having projections/depressions of a two-dimensional periodic structure at an upper surface thereof to diffract light from the active layer at the projections/depressions and guide the diffracted light to an outside of the semiconductor multilayer film. See Fig.14A and Fig.15A.

Regarding claim 4, Niki et al. teaches that a height of each of the projections/depressions is $\frac{1}{4}$ of a wavelength. See [0022] and [0023].

Regarding claims 5 and 6, the transparent layer is a first nitride semiconductor layer (32) and an electrode layer (34) is further provided on the first nitride semiconductor layer (see [0027]), wherein an upper surface of the electrode layer is provided with projections/depressions reflecting the projections/depressions of the upper surface of the first nitride semiconductor layer.

Regarding claims 9 and 10, Niki et al. teaches that the semiconductor multilayer film further has a nitride semiconductor layer of a first conductivity type (p-type layer 32) provided on the active layer and a nitride semiconductor layer of a second conductivity type (n-type layer 30) provided under the active layer and the transparent layer has an electrode layer (34) provided on the nitride semiconductor layer of the first conductivity type, wherein an upper surface of the electrode layer is provided with the projections/depressions of a two-dimensional periodic structure.

Regarding claim 11, Niki et al. et al. teaches that the transparent layer further has a layer (36) provided on the electrode layer.

Claims 1, 5-6, 8-11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Okazaki et al. (US 6,495,862).

Regarding claim 1, Okazaki et al. discloses semiconductor light-emitting device comprising an element having: a semiconductor multilayer film containing a nitride and having an active layer; and an ITO transparent layer (13) (col.7 lines 9-12) provided on

the semiconductor multilayer film and having projections/depressions of a two-dimensional periodic structure at an upper surface thereof to diffract light from the active layer at the projections/depressions and guide the diffracted light to an outside of the semiconductor multilayer film. See Fig.5.

Regarding claims 5, 6 and 8, as shown in Okazaki's Fig.5, the transparent layer is a first nitride semiconductor layer (4) and an electrode layer (13) is further provided on the first nitride semiconductor layer, wherein an upper surface of the electrode layer is provided with projections/depressions reflecting the projections/depressions of the upper surface of the first nitride semiconductor layer.

Regarding claims 9, 10 and 13, as shown in Okazaki's Fig.5, the semiconductor multilayer film further has a nitride semiconductor layer of a first conductivity type (p-type layer 4) provided on the active layer and a nitride semiconductor layer of a second conductivity type (n-type layer 2) provided under the active layer and the transparent layer has an electrode layer (13) provided on the nitride semiconductor layer of the first conductivity type, wherein an upper surface of the electrode layer is provided with the projections/depressions of a two-dimensional periodic structure.

Regarding claim 11, as shown in Okazaki's Fig.5, the transparent layer further has a layer (6) provided on the electrode layer.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niki et al.

Niki et al. teaches all the limitations of claims 1, 4-6, and 9-11 as shown above. Niki et al. does not explicitly teach that when a distance between each of depressed portions of the projections/depressions and the active layer is D and a wavelength of the light from the active layer in the element is λ , $D \leq 5\lambda$ is satisfied; and when a period of the projections/depressions is L and a wavelength of the light from the active layer in the element is λ , $\lambda \leq L \leq 5\lambda$ is satisfied.

It would have been obvious to one of ordinary skill in the art to provide the distance between each of depressed portions of the projections/depressions and the active layer and the period of the projections/depressions as claimed because these dimensions would have been determinable by one of ordinary skill in the art through no more than routine experimentation. See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 2, 3, 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki et al.

Okazaki et al. teaches all the limitations of claims 1, 5-6, 8-11 and 13 as shown above. Okazaki et al. does not explicitly teach the following: a height of each of the projections/depressions is $\frac{1}{4}$ of a wavelength; when a distance between each of depressed portions of the projections/depressions and the active layer is D and a wavelength of the light from the active layer in the element is λ , $D \leq 5\lambda$ is satisfied; when a period of the projections/depressions is L and a wavelength of the light from the active layer in the element is λ , $\lambda \leq L \leq 5\lambda$ is satisfied; and the electrode layer having a film thickness of 50 nm or less.

It would have been obvious to one of ordinary skill in the art to provide the distance between each of depressed portions of the projections/depressions and the active layer and the period of the projections/depressions as claimed because these dimensions would have been determinable by one of ordinary skill in the art through no more than routine experimentation. See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

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Conclusion

4. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (571) 273-8300. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

5. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (571) 272-1661. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Eddie Lee who can be reached on (571) 272-1732.



Cuong Nguyen

Primary examiner

12/29/05